1. (Currently Amended) A method ~~for determining an~~ to determine occupancy of a space, comprising:

providing an optical energy source to generate ~~optically generating~~ at least one fan light beam;

defining a reference plane in the space that corresponds to ~~the~~ said at least one fan light beam;

disposing a sensor at a known vertical position relative to said reference plane, said sensor having a field of view encompassing at least an intersection of an object within said space with said reference plane;

d~~etermining that an object intersects the plane at an intersection~~ recognizing from an output of said sensor any object intersection of said reference plane; ~~by interpreting an output of an optical imaging sensor placed in a known vertical position relative to the plane, the optical imaging sensor having a field of view that substantially coincides with the plane, and wherein the object is in the field of view;~~ and

determining ~~the~~ occupancy of ~~the~~ said space by calculating a shape of ~~the~~ any said intersection, a size of ~~the~~ any said intersection, and a relative location of ~~the~~ any said intersection in ~~the~~ said space;

wherein occupancy within said space is determinable using a priori positional relationship between said optical energy source and said sensor without requiring a priori positional knowledge of said object.

2. (Currently Amended) The method of claim 1, wherein ~~optically generating at least one fan light beam includes generating the fan light beam to have a spectrum in one of a group of spectra comprising~~ said optical energy source outputs optical energy selected from a group consisting of visible spectra and invisible spectra.

3. (Currently Amended) The method of claim 1, wherein ~~defining the reference plane includes using a~~ said reference plane is defined using a rotating

light source selected ~~form~~ from a group ~~comprising~~ consisting of a laser and a light emitting diode.

4. (Currently Amended) The method of claim 1, wherein ~~optically generating at least one fan light beam includes using~~ said optical energy source includes a scanning light beam.

5. (Currently Amended) The method of claim 1, wherein said optical energy source includes at least one source selected from a group consisting of a laser and a light emitting diode. ~~the optically generated fan light beam includes at least one or more of a laser or a light emitting diode.~~

6. (Currently Amended) The method of claim 1, wherein ~~the~~ said reference plane is ~~generated by one or more of a laser or~~ defined using at least one of a laser and a light emitting diode.

7. (Currently Amended) The method of claim 1, wherein ~~the~~ said reference plane includes at least one plane ~~is~~ selected ~~form~~ from a group consisting of ~~comprising the~~ ground, ~~the~~ a floor of a building, ~~the~~ a floor of a room, and ~~the~~ a floor of a compartment.

8. (Currently Amended) The method of ~~claims~~ claim1, wherein said sensor includes a digital camera. ~~the imaging sensor corresponds to a digital camera with a field of view, and having a light sensitivity that can image the intersection pattern.~~

9. (Currently Amended) The method of ~~claims~~ claim 1, wherein a vertical distance ~~of the imaging~~ between said sensor and said ~~from the~~ reference plane is determined using a size of a smallest object to ~~that must~~ be detected by ~~the~~ said sensor.

10. (Currently Amended) The method of claim 1, wherein ~~determining~~ recognizing includes:

~~taking~~ acquiring a reference training image of ~~the~~ an intersection;

~~taking another~~ acquiring a second image of ~~the~~ said space;

processing differences between ~~the~~ said training image and ~~the other~~ said second image, including differences in intersection patterns ~~in respective images~~; and

if an object is recognized as intersecting said reference ~~it is determined that an object intersects the~~ plane at an intersection, estimating size and location of said object. ~~a size of the object and estimating a location of the object.~~

11. (Currently Amended) A method ~~for detecting the~~ to detect presence of at least one object ~~objects~~ in a region of interest, comprising:

disposing a source of optical energy to emit optical energy towards a potential location of said at least one object within said region of interest;

~~using~~ disposing a single-sensor three-dimensional camera ~~device with~~ having a field of view ~~that~~ substantially ~~coincides~~ coinciding with ~~the~~ said region of ~~the~~ interest ~~for detecting~~ to detect occupancy of an object in said region of interest using optical energy emitted by said source of optical energy and reflected at least in part from said object, said camera disposed in known registration relative to location of said source of optical energy;

detecting with ~~using~~ at least one image processing ~~algorithms to detect~~ algorithm at least one object nearest ~~objects closest to the 3D~~ said three-dimensional camera ~~device~~; and

calculating with ~~using~~ at least one image processing ~~algorithms~~ algorithm ~~to calculate~~ a volume in front of and behind ~~the closest~~ a nearest object. ~~objects and a volume behind the closest objects.~~

12. (Currently Amended) The method of claims 11, wherein ~~the~~ said three-dimensional ~~three dimensional~~ camera ~~device~~ includes a stereo-vision camera ~~device~~.

13. (Currently Amended) A system ~~for detecting the~~ to detect presence of at least one ~~object~~ ~~objects~~ in a space, comprising:

at least one ~~light~~ optical energy source ~~for generating~~ to generate a fan light beam that defines ~~as~~ an optical reference plane;

at least one camera ~~device~~ disposed at ~~in~~ a known vertical position relative to ~~the~~ said reference plane and having a field of view encompassing at least a portion of said ~~that substantially coincides with the~~ reference plane; and

an image processing system to ~~configured to (i)~~ process images ~~produced~~ acquired by ~~the~~ said camera ~~for detecting~~ to detect therefrom any ~~an~~ intersection of ~~an~~ a viewed object ~~in the field of view intersects the~~ and said reference plane, and to determine from a processed said image and from at least one intersection characteristic ~~(ii) determine, from a processed image, an~~ occupancy in a said space; ~~that includes the field of view using one or more characteristics of the intersection.~~

wherein occupancy within said space is determinable using a priori positional relationship between said at least one optical energy source and said camera without requiring a priori positional knowledge of said object.

14. (Currently Amended) A system ~~for detecting~~ to detect an object in a space, comprising:

at least one sensor ~~device that takes~~ to acquire an image of ~~the~~ said space, wherein an image comprises an instance of light recorded on a medium;

~~a means~~ means for defining a reference plane using at least one fan light beam; and

means for determining from different images of said space whether the object intersects ~~the~~ said reference plane at an intersection; ~~, wherein determining includes comparing different images of the space.~~

wherein detection of an object in said space is determinable absent a priori positional knowledge of said object in said space.

15. (Currently Amended) The system of claim 14, wherein ~~the~~ said means for defining includes at least one of a physical surface and at least one light beam.

16. (Currently Amended) The system of claim 14, wherein ~~the~~ said sensor includes a sensor selected from a group consisting of a digital camera and a three-dimensional range sensor. ~~device is either a digital camera or a three dimensional range sensor.~~

17. (Currently Amended) The system of claim 14, further comprising means for processing ~~the~~ different images of ~~the~~ said space to determine whether ~~the~~ said space is empty.

18. (Currently Amended) The system of claim 17, further comprising means for processing ~~the~~ different images of ~~the~~ said space to calculate a fullness factor ~~for the space when the~~ when said space is determined to be non-empty.

19. (Currently Amended) The system of claim ~~17~~ 14, wherein said system is disposed in an environment selected from a group consisting of a movable robot and a motor vehicle. ~~further comprising means for processing the different images of the space to calculate a full-ness factor for the space when the space is determined to be non-empty.~~

20. (Currently Amended) The system of claim 17, further comprising means for processing ~~the~~ different images of ~~the~~ said space to calculate ~~the~~ an object in ~~the~~ said space when ~~the~~ said space is determined to be non-empty.